

**What is claimed is:**

1. An ultrasonic and infrared transmitter with tunable carrier frequency comprising:

- 5       a frequency divider for receiving an oscillation frequency and  
          dividing said frequency to produce a carrier signal;  
      a multiplexer for receiving said carrier signal from said  
          frequency divider and a data signal and controlling  
          outputs by use of a select control signal;  
10       an output buffer connected to said multiplexer for outputting  
          said carrier signal; and  
      an infrared light emitting diode or ultrasonic transducer  
          connected to said output buffer for transmitting an  
          infrared or ultrasonic carrier signal.

15       2. An ultrasonic and infrared transmitter according to claim 1  
      wherein said multiplexer controls said outputs by use of said select  
      control signal for infrared or ultrasonic transmission and data  
      input/output.

20       3. An ultrasonic and infrared transmitter according to claim 1  
      further comprising at least one output port for outputting ultrasonic  
      carrier signals.

25       4. An ultrasonic and infrared transmitter according to claim 1

further comprising at least one output port for outputting infrared carrier signals.

5 5. An ultrasonic and infrared transmitter according to claim 1 further comprising two output ports for outputting ultrasonic or infrared carrier signals having opposite phases.

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10 6. An ultrasonic and infrared transmitter according to claim 5 wherein said two output ports form a push-pull architecture to drive an ultrasonic transducer or infrared light emitting diode.

7. An integrated circuit ultrasonic and infrared transmitter with tunable carrier frequency comprising:

a frequency divider for receiving an oscillation frequency and dividing said frequency to produce a carrier signal;

a multiplexer for receiving said carrier signal from said frequency divider and a data signal and controlling outputs by use of a select control signal; and

an output buffer connected to said multiplexer for outputting said carrier signal.

20 8. An integrated circuit ultrasonic and infrared transmitter according to claim 7 wherein said multiplexer controls said outputs by use of said select control signal for said integrated circuit  
25 applicable to infrared or ultrasonic transmission and data

input/output.

9. An integrated circuit ultrasonic and infrared transmitter according to claim 7 further comprising at least one output port for outputting ultrasonic carrier signals.

10. An integrated circuit ultrasonic and infrared transmitter according to claim 7 further comprising at least one output port for outputting infrared carrier signals.

11. An integrated circuit ultrasonic and infrared transmitter according to claim 7 further comprising two output ports for outputting ultrasonic or infrared carrier signals having opposite phases.

12. An integrated circuit ultrasonic and infrared transmitter according to claim 11 wherein said two output ports form a push-pull architecture to drive an ultrasonic transducer or infrared light emitting diode.